which our Nival flora has in common with the Arctic zone.

(7) This Arctic flora probably arose on the mountains of the Arctic zone, and stood in the same relation, in the Miocene period, to the flora of the Arctic lowland as the present Alpine flora to the flora of the Swiss lowland.

(8) The Miocene Arctic flora advanced to Europe in the Tertiary period, and the European Tertiary flora received from it the types which now characterise the temperate zone, viz. the pine-woods and foliage-trees with deciduous leaves. In course of time these dominated more and more over the tropical and sub-tropical forms, which were the original occupiers of these regions, and became the mother-plants of a portion of the present lowland flora.

(9) In the Glacial period the mountain plants of the Arctic zone descended into the lowland, and spread southwards with the glaciers. As in the Tertiary period the trees and bushes with deciduous foliage wandered southwards, so in the Glacial period did the mountain plants; and that this migration took place radially from the north is proved by the fact that not only in the snow region of our Alps nearly the half of the plant species consists of Arctic species, but also the American mountains, and on the other side the Altai, and even the Himalaya, have quite a number of such Arctic species, and have them in common with the Swiss Alps. We know that already in the Tertiary period, and also in the period of the Upper Cretaceous, a number of plants can be traced from Greenland on to Nebraska, in North America, and on the other hand to Bohemia, Moravia, and on to Southern Europe. Thus in the period of the Cretaceous formation, in the Tertiary, and in the present formation, we find the same phenomenon: that Europe with America has a number of species in common which were formerly indigenous in the Arctic zone, and therefore very probably went out from that as their original home. The same process is thus repeated in different ages; the plant-world of the high north has at all times exercised a great influence on the formation of the plant-covering of Europe.

(10) The endemic flora of the Nival region arose in our Alps. A principal centre of its formation seems to have been the Monte Rosa chain, in which probably, even during the Glacial period, extensive mountain masses of ice and *névé* were liberated.

(11) This flora received at the beginning of the Quaternary period its present character, and spread on the moraines of the glaciers into the lowland and into the mountainous regions of the neighbouring countries.

(12) Its mother flora had probably its abode in the Tertiary mountain country of Switzerland.

NOTES

WE understand that the post of Assistant Director of the Royal Gardens, Kew, has been offered to Mr. D. Morris, M.A., F.G.S., the Director of Public Gardens and Plantations, Jamaica. The appointment is in the gift of the First Lord of the Treasury.

So much has been heard during the last few years of the services rendered to the science, industry, and commerce of the West Indies by the public gardens and Government plantations of Jamaica under the superintendence of Mr. Morris, that it is with surprise and regret that we learn that the future efficiency of these institutions is seriously threatened. A Select Committee, it appears, was recently appointed, under a resolution of the Council of Jamaica, "to consider the means of diminishing the expenses of the Government," and, among other suggestions and recommendations, it proposed that the Government cinchona plantations should be sold, and that the public gardens at Kingston should be handed over to the local authorities of that town to be maintained by them, instead of, as heretofore, by the Government, under the Director of Public Gardens. Committees appointed under these circumstances are generally more anxious to justify their existence by making recommendations than careful to inquire where they would be always possible or desirable. The cinchona plantations, thus threatened with extinction, were founded in 1868 by Sir John Peter Grant, and now consist of 150 acres under cinchona, with smaller areas under jalap, tea, and nurseries for timber and shade trees. According to the "Handbook of Jamaica," they distributed in five years to private planters 1200 ounces of cinchona-seed, 1,200,000 cinchona seedlings, 400,000 cinchona plants, besides large quantities of timber and shade trees for re-foresting purposes. The Kingston Gardens, which are to be taken from under Mr. Morris's control, are used as a depot for plants from the other establishments, and also as the centre of distribution of plants and seeds to all parts of Jamaica and of the West Indies; there is no doubt, therefore, that they fulfil important functions.

IF there was a single department in the whole Government service on which West Indian economists should have refrained from laying their hands except by way of increasing its scope and efficiency, we should have thought Mr. Morris's department that one. For if the West Indian Islands are ever to emerge from the disastrous economical condition of the past thirty years, and regain their previous flourishing state, it will be by the labours of institutions such as the public gardens, and of men such as Mr. Morris. Their old staples are useless to them, for Europe can buy them cheaper in other markets, and they must find new ones, or plunge deeper into the mire of financial embarrassment and bankruptcy, public and private. This can only be done by experiments and careful observations which no one but a public department and skilled botanists can carry out. Happily the economic value of the gardens in Jamaica have been recognised by the highest authorities. The Royal Commissioners stated that the department was invaluable, and that it was in as good a state as the sums placed at Mr. Morris's disposal would allow. The Governor coincided in this testimony, and added that "Mr. Morris was untiring in his endeavours to induce persons to commence new industries calculated to develop the resources of the island, and to bring about a condition of prosperity which would go far to counterbalance the depression under which the sugar industry of Jamaica now labours." It may be hoped therefore, notwithstanding the report of the Committee on Government Economy, that the department may be permitted to pursue its "invaluable" work on the same lines and with undiminished means.

MR. SAMUEL BIRCH, D.C.L., LL.D., F.S.A., Keeper of the Egyptian and Oriental Antiquities in the British Museum, died, on the 27th inst., in his seventy-second year. Dr. Birch had served in the British Museum for fifty years, during the last part of which he was in charge of the Egyptian and Assyrian antiquities, and it is with this department of Oriental scholarship that his name will ever be associated. His early writings of nearly fifty years ago dealt mainly with Chinese subjects, and one of his first duties at the British Museum was to catalogue the large collection of Chinese coins, and throughout the greater part of his life he manifested his interest in Chinese subjects by various publications. He was twice despatched to Italy on archæological missions on behalf of the Government, and in 1860 founded the Society of Biblical Archæology. His works on all departments of Egyptology fill many volumes, and extend over more than forty years, and at the time of his death he had in the press one work, while another, a new dictionary of hieroglyphics, was nearly completed.

No authentic information is to hand yet to explain the terrible and disastrous colliery explosion at the Mardy mine last week. The atmospheric pressure had been unusually high, and so far as we have been able to gather, coal-dust played an important part in the explosion. No doubt some facts as to the condition of the mine will come out at the inquest on January 12.

The following are the arrangements for the Friday evening lectures at the Royal Institution before Easter:—January 22: Prof. Tyndall, F.R.S., Thomas Young and the Wave Theory; January 29: Sir William Thomson, F.R.S., Capillary Attraction; February 5: T. Pridgin Teal, F.R.C.S., The Principles of Domestic Fireplace Construction; February 12: Prof. Osborne Reynolds, F.R.S., Experiments showing Dilatancy, a Property of Granular Material, Possibly Connected with Gravitation; February 19: W. K. Parker, F.R.S., Birds, their Structure, Classification, and Origin; February 26: A. A. Common, F.R.S., Photography as an Aid to Astronomy; March 5: Prof. Alexander Macalister, F.R.S., Anatomical and Medical Knowledge of Ancient Egypt; March 12: Reginald Stuart Poole, Corresp. Inst. France, The Discovery of the Biblical Cities of Egypt; March 19: W. H. M. Christie, F.R.S., Astronomer Royal, Universal Time; March 26: Wm. Chandler Roberts-Austen, F.R.S., M.R.I., Chemist of the Mint, on Certain Properties Common to Fluids and Solid Metals; April 2: Howard Grubb, F.R.S., Telescopic Objectives and Mirrors—their Preparation and Testing; April 9: William Anderson, M.Inst.C.E., New Applications of the Mechanical Properties of Cork to the Arts; April 16: Prof. Sir Henry E. Roscoe, M.P., F.R.S.

We regret to learn that Dr. W. Sklarek, who founded *Naturforscher* eighteen years ago, and has conducted it since, has resigned the editorship of that well-known journal, which will now be published by the Laupp'schen Buchhandlung, Tübingen. Dr. Sklarek, we understand, will edit a new journal of a similar kind to be published in Brunswick.

It is stated that experiments are being made at Prof. Lieben's chemical laboratory at Vienna, with a new gaslight invented by Dr. Auer. A cotton wick, saturated with an incombustible metal solution, is introduced into the flame of an ordinary Bunsen lamp, the result being a light similar to the incandescent electric light.

Mr. Leslie Stephen's "Life of Henry Fawcett," just published by Messrs. Smith, Elder and Co., contains two very characteristic letters from Darwin, which now see the light for the first time. Mr. Stephen refers to the deep impression made on Fawcett's mind by the "Origin of Species." He became an enthusiastic Darwinian, and in December 1860 published an article in which "he states with his usual firmness the true logical position of Darwin's theory; distinguishing carefully between a fruitful hypothesis and a scientific demonstration; exhibiting the general nature of the argument and the geological difficulty with great clearness, and taking some pains to prove that religion is in no danger from Darwinism." This led to a correspondence with Darwin, and in one of the letters the latter, after referring to his satisfaction at hearing that Mill considered his book a piece of thorough logical argument, adds:—"Until your review appeared I began to think that perhaps I did not understand at all how to argue." In a second letter, dated September 18, 1861, thanking Fawcett for a paper of his read before the British Association, Darwin writes:—"You will have done good service in calling the attention of scientific men to means and laws of philosophising. As far as I could judge by the papers, your opponents were unworthy of you. How miserably A talked of my reputation, as if that had anything to do with it. How profoundly ignorant B [who had said that Darwin should have published facts alone] must be of the very soul of observation! About thirty years ago there was much talk that geologists ought only to observe and not theorise; and I well remember some saying that at this rate a man might as well go into a gravel-pit and count the pebbles and describe the colours. How odd it is that any one should not see that all observation must be for or against some view if it is to be of any service!" Referring to his health Darwin says he is one of those miserable creatures who are never comfortable for twenty-four hours; "and it is clear to me that I ought to be exterminated." Again he says that to him "observing is much better sport than writing." Referring to the timidity with which men of science received his theory, he wrote: "The naturalists seem as timid as young ladies should be, about their scientific reputation." The whole of the correspondence at this time (1860-61) between Darwin and Fawcett, of which Mr. Stephen only gives the two letters here quoted, should be of very great general interest.

The Vienna Correspondent of the *Times* reports that Dr. Gautsch, the new Minister of Public Instruction in Austria, has prohibited the use of paper ruled in square or diagonal lines within all public schools. The reason of this is that such paper has been found to injure the eyesight of pupils. It has been largely used hitherto in primary schools to facilitate writing and arithmetic lessons; but in future only paper plain or ruled in straight lines is be used.

A striking case of vital resistance in fishes has been lately reported by M. Douaret de Bellesme, Manager of the Aquarium of the Trocadéro in Paris. On November 18 a fishmonger, M. Heydendare, received from Gonda (the centre of fisheries in the region about Rotterdam) a large consignment of fishes packed and preserved in ice. They could not have been caught later than the 16th, and were probably caught on the 15th. On unpacking, a jack was seen to move its gills slightly, and the idea occurred to wash it with fresh water, and immerse it in a vessel. In a few hours the fish was in its normal state, and very lively. M. Heydendare sent it to the Trocadéro Aquarium, where it is to be seen now; it is a fine animal, about 2 feet 4 inches long. Here, then, is a case of a fish out of water more than forty-eight hours (probably three days), packed with little care, along with dead fish and pieces of ice—travelling thus 280 miles, and coming to life again. The lowering of temperature was doubtless very favourable to maintenance of the vital functions.

Three tall chimneys belonging to Kunheim and Co., of Berlin, were lately destroyed by means of gun-cotton. The largest was about 147 feet high, and 10 feet diameter at the base. In order that it should fall outwards from the city, the charge of gun-cotton (about 57 lbs.) was attached in portions to the side next the city, and to the adjacent sides. All three were exploded simultaneously with a magneto-electric apparatus. The chimney, instead of falling obliquely, collapsed vertically, and on inspection the four walls of the pedestal were found to have been driven outwards. The bricks were all detached from each other, and nearly all entire. The debris was thrown a very little distance. The two other chimneys, treated similarly, fell as was expected, *i.e.* obliquely away from the city. One of them, in falling, broke in two about the middle.

Recent issues of *Globus* contain two most interesting articles on the investigations into the antiquities of the Island of Bornholm, carried on for a considerable period by its former chief official, Herr Wedel. The Stone Age is extensively represented, although kitchen-middens appear to be wholly absent, by graves, stone coffins, and other objects. The first contain unburnt, as well as the remains of cremated, bodies, but the latter are found under such circumstances as to lead to the conclusion that they belong to a later period. With the exception of stone chisels, all the objects usually found in graves belonging to the Stone Age are found, such as axes, arrow-heads, and the like. Amber ornaments also frequently occur. The stone coffins, which are sometimes very large, are also numerous, and in the mounds with them are frequently found the bones of cremated bodies. On this question, Herr Wedel comes to the conclusion that cremation in Bornholm must have been introduced towards the close of the Stone Age. Most of the objects were apparently made in the island itself; but it is not improbable that the larger flint articles, or possibly the blocks from which they are made, come from places where flint is more plentiful than in Bornholm. Traces of houses belonging to this age have also been found. On the whole, the island during this period does not appear to have been thickly populated; the people moved hither and thither, and appear to have had domestic animals. The remains of the Bronze Age are also very numerous and interesting; of these a full account is given, and it is interesting to notice that, during this period, cremation appears to have been the usual method of disposing of bodies of the dead. Similarly, the finds belonging to the Iron Age are described, and, in conclusion, the writer says that in Bornholm we can trace, without important breaks, human development from the Stone Age down to historic times. Nothing appears, he says, in this long history to show that there was any sudden alteration in the growth of civilisation such as might be caused by the influx of a new tribe. Such an influx, had it taken place, would certainly have left recognisable marks behind it; and, indeed, the thick population of the island in the Bronze and earlier Iron Ages left no opportunity for the settlement of any external people in Bornholm.

THE method of placing electric lamps in front of locomotives to illuminate the line, has been tried on many lines, but apparently has not found much favour. Recent experience in Russia appears to show that financial considerations are not alone unfavourable to the system. On the railway between St. Petersburg and Moscow several locomotives were fitted with electric lamps. For a time they gave great satisfaction, lighting the way more than a kilometre in front. But the *employés* began to complain of the contrast between the lighted and the unlighted surfaces painfully affecting the eyes; and doctors ere long reported that there had been several cases of grave injury to the eyes in this way. Hence the lamps were abandoned. The directors have not, however, given up the idea of better illumination of the line, and they now contemplate placing electric lamps so as to illuminate about 1 kilometre on either side of the station.

THE best plant at present known for consolidating, by the interlacing of its roots the loose soil of a newly-made embankment is, according to M. Cambier (of the French Railway Service), the double poppy. While the usual grasses and clovers need several months for the development of their comparatively feeble roots, the double poppy germinates in a few days, and in two weeks grows enough to give some protection to the slope, while at the end of three or four months, the roots, which are 10 or 12 inches long, are found to have interlaced so as to retain the earth far more firmly than those of any grass or grain. Though the plant is an annual, it sows itself after the first year, and with a little care the bank is always in good condition.

ACCORDING to an official statement issued by the Japanese Government, there occurred 553 earthquakes during the nine years and six months preceding December 1884, averaging one earthquake for every six days and six hours. This must, however, refer to the capital and the surrounding district only, and earthquakes of great violence can alone be counted, for Prof. Milne was able to trace an average of an earthquake per day in Nagasaki, in the extreme south of the Japanese archipelago. The official statistics, on the other hand, may possibly be compiled from the returns of local officials all over the country, in which case only those shocks which caused loss of life or damage to property would be included. If this hypothesis is correct, we should have an average of more than an earthquake per week which was so violent that it caused injuries to life or property sufficiently serious to attract the attention of the local authorities, and, in their judgment, to require a report to the central Government.

M. HERZEN contributes to a recent number of the *Revue Scientifique* an account of certain experiments which he made recently on the thermic sense in animals. His observations on man had already led him to the conclusion that impressions of heat are conveyed to the brain by the gray substance of the spinal marrow. Animals, he found, on the other hand, do not react under the impressions of moderate heat, and when the latter is excessive the reaction is one of pain, not of the specific sensation of heat. On the contrary, however, cold operates on them actively, and M. Herzen succeeded in demonstrating by his experiments that impressions of cold in animals are really conveyed by the medullary rays which transmit the impressions of touch. The various experiments which are briefly described in the article satisfied him that the cortical lesions which destroy sensibility to touch also destroy that of cold, and, when the first is preserved, the latter likewise remains; and that, in brief, impressions of contact and of cold are transmitted in the same way to the same regions of the cortical layer of the hemispheres.

IN a recent article on the work of the Asiatic Society of Bengal, originally founded by Sir William Jones, during the first century of its existence, we referred to the division of its publications into literary and scientific, the numbers of the *Journal* of the Society in each case being quite distinct. We have now before us the scientific numbers of the *Journal* for the past year, and they show remarkable activity. It should be remembered that there are independent societies in Madras and Bombay, so that the Bengal Society's publications represent the work of one Presidency only. Amongst the scientific papers published during the year are the following:—The theory of the winter rains in Northern India, by Mr. Blanford, the President of the Society, and the Meteorological Reporter to the Government of India; descriptions of some new Asiatic diurnal *Lepidoptera*, chiefly from specimens contained in the Indian Museum in Calcutta, by Mr. Frederic Moore; a new species of *Simulium* from Assam, by Dr. Becher, of Vienna; variations of rainfall in Northern India during the sun-spot period, by Mr. Pearson, the Meteorological Reporter for Western India; a description of a new Lepidopterous insect belonging to the Heterocerous genus *Trabala*, by Mr. Moore; *Phyllothelys*, a remarkable genus of *Mantodea*, from the Oriental region, by Prof. Wood-Mason; notes on the Indian *Rhynchota*, by Mr. Atkinson; a list of Lepidopterous insects collected in Cachar, by Mr. Moore (the first part, dealing with *Heterocera*, has alone been published so far); revised synopsis of the species of *Chœradodis*, a remarkable genus of *Mantodea*, common to India and tropical America, by Prof. Wood-Mason; and finally, an account of the two remarkable south-west monsoon storms in the Bay of Bengal in 1883, by Mr. Eliot, the Meteorologist to the Bengal Government. It should be added that these papers are, where necessary or desirable, copiously illustrated.

IT is interesting to note that the various species of Salmonidæ at the Aquarium, South Kensington, have been recently spawned by artificial means, the sea trout being crossed with the Gilleroo and Levenensis trout. A very large yield of ova was obtained, all of which presented signs of healthiness and complete impregnation. Although the fish spawned have been in captivity for four years, they shed their eggs with the same ease as those subjected to natural conditions.

A LARGE number of Salmonidæ eggs are being incubated at the Buckland Museum. It will be remembered that fish-hatching operations were carried out extensively here by the late Frank Buckland, but after his death they subsided, and until this year the apparatus used by him were not called into use. The re-introduction of this feature will afford much gratification to visitors, and especially to those having the interest of the great naturalist's collection at heart. Besides, the authorities have, by this act, shown their sympathy with fish-culture, and have also set an example which might be emulated by the public elsewhere. It may not be generally known, but the Museum does not contain nearly all the exhibits comprised in the Buckland Collection, which cannot be adequately shown to the public in the limited space allotted to the exhibits.

THE Dutch Government has instituted Christmas telegraphic messages at a reduced rate, containing merely the name and address of senders and receivers.

THE numbers of that valuable periodical, the *Indian Antiquary* for 1885, though of course mainly occupied with papers on the special field of Indian scholarship, contain also many of general scientific interest. Thus a considerable space is devoted to folk-lore: there are four papers on the folk-lore of Southern India; one on that of Western India; a paper on the omens from the falling of house-lizards, which is curious from the minuteness with which every part of the body, even the smallest, on which a lizard could fall is provided with its appropriate omen, that for men and women being different. The modes by which evil omens may be averted are added. There is also a selection of Kanarese popular ballads. There are also two learned articles by Prof. V. Ball, in which he seeks to identify the animals and plants of India which were known to early Greek authors. One result of his interesting investigations (as indeed of all similar investigations into the works of early writers, Marco Polo, for example), is to show that most of the statements of these writers, usually ridiculed as extravagant or fictitious, rest on substantial bases of fact.

THE additions to the Zoological Society's Gardens during the past week include a Macaque Monkey (*Macacus cynomolgus*) from India, presented by Mrs. A. Murray; an American Robin (*Turdus migratorius*) from North America, presented by Mr. A. Saunders; two Hybrid Ruddy Sheldrakes (between *Tadorna rutila* and *Chenalopex ægyptiaca*), bred in France, deposited; a Sing-Sing Antelope (*Cobus sing-sing* ♂) from West Africa, received in exchange.

OUR ASTRONOMICAL COLUMN

EFFECT UPON THE EARTH'S MOTION PRODUCED BY SMALL BODIES PASSING NEAR IT.—Prof. H. A. Newton has published a paper on this subject in the *American Journal of Science* for December, 1885. He points out that the space through which the earth travels is traversed also by small bodies or meteoroids. The impact of these bodies upon the earth and the consequent increase of the earth's mass have their effect upon the earth's motions both of rotation and revolution. The moon's orbit and the length of the month likewise suffer change. Prof. Oppolzer (*Astron. Nachrichten*, No. 2573) has considered the amount of these actions, and has computed the density which the meteoroid matter must have in the space which the earth is traversing in order to account for the observed and unexplained acceleration of the moon's mean motion. But a body that passes near the earth has also an action of like character by reason of the attraction of gravitation alone, and the conclusion at which Prof. Newton arrives is that these latter bodies do not have an effect at all comparable with that produced by those which actually come into the earth's atmosphere. In fact his investigation shows that the effect upon the earth's motion of the meteors that come into its atmosphere exceeds at least one-hundredfold that of the meteors that pass by without impact.

THE TEMPERATURE OF THE SURFACE OF THE MOON.—Two important memoirs on this subject have recently been published in a separate form. Of these the first is one by the Earl of Rosse and Dr. Otto Boeddicker on "The Changes of the Radiation of Heat from the Moon during the Total Eclipse of October 4, 1884," communicated to the Dublin Royal Society. It will be remembered that Dr. Boeddicker gave a summary of his observations in a communication to NATURE, vol. xxx. p. 589, and stated that the minimum of heat was observed later than the minimum of light. As, however, the diminution of heat was very rapid, and amounted to $\frac{89}{90}$ of the entire amount received from the unobscured full moon, the conclusion from these observations would appear to be that the amount of heat radiated to us from the moon itself as distinguished from that merely reflected or diffused by it, is almost insensible.

The second memoir is by Prof. Langley (the conclusions of which will be found on p. 211), and was communicated to the American National Academy of Sciences, October 17, 1884. It commences with a review of previous researches, Lord Rosse's papers being carefully summarised. The diathermancy of glass for solar and lunar rays respectively, is next investigated, and it was found, as Lord Rosse had previously done, that a much larger percentage of the solar than of the lunar rays was transmitted through glass. Prof. Langley next endeavoured to ascertain whether this effect was due to a general absorption resulting in a heating of the moon's soil with a consequent radiation of heat of a much lower refrangibility than that received, or to a *selective* absorption by the moon of the more refrangible rays. His observations convinced him that the latter condition prevails to a remarkable extent, so that there is "a preponderance in the lunar spectrum of the rays of long wave-length, and hence a tendency to cause a smaller percentage of lunar rays to be transmitted by glass than of solar, and this independently of any effect from heat re-radiated by the lunar soil."

It had been generally assumed, prior to Prof. Langley's bolometer researches, that our atmosphere was most transparent to the visible portion of the spectrum. Prof. Langley has shown, on the contrary, that the coefficient of transmission steadily increases towards the extreme infra-red, up to the point $\lambda = 3\mu$, where the solar spectrum ceases to give any further evidence of its existence. The present research seems to show that this sudden termination of the spectrum is not due to our atmosphere, for Prof. Langley has been able to form a heat-spectrum from the lunar rays, which he is able to trace considerably further in the longer wave-lengths than that of the sun. This lunar spectrum shows two maxima, one fairly corresponding with "the solar curve maximum, the second indefinitely lower down in the spectrum, corresponding to a greater amount of heat at a lower temperature." This latter portion of the spectrum Prof. Langley considers as being clearly due to the moon itself, and as revealing its real temperature. This temperature, he concludes from his study of the spectra of cold bodies, is lower than that of melting ice. In a further paper read before the National Academy in November last, Prof. Langley states that a comparison of the spectra obtained from the moon in summer with those obtained in winter, shows that a much greater amount of heat is received in the latter season than the former, a difference probably due to the greater amount of aqueous vapour in our atmosphere during summer. He also mentions that he has made the first attempt to determine the temperature of space by direct experiment.

NEW COMET.—A telegram from Prof. Krueger, Kiel, announces the discovery of a new comet by Mr. W. R. Brooks, Red House Observatory, Phelps, New York. The following places have been obtained at the Harvard College Observatory:—

Cambridge M.T.		R.A.		Decl.
h. m.		h. m. s.		° ′
1885 Dec. 27, 8 11·6	...	19 55 40	...	4 8·0 N.
28, 6 30·0	...	19 59 3	...	4 31·6 N.